



FMU-160B: 105mm PROXIMITY FUZE FOR THE AC130



*36th Annual Gun & Ammunition
Symposium & Exhibition*



Dave Lawson, Bob Hertlein
KDI Precision Products, Inc.

Telly Manolatos
Electronics Development Corp

KDI Precision Products, Inc.
An ISO 9001 Registered Company

<http://www.kdi-ppi.com>



Presentation Outline



- **Application**
- **Need for Improved Proximity Fuze**
- **Design Goals**
- **Design Approach**
 - ✧ **RF Front End**
 - ✧ **Signal Processor**
 - ✧ **Battery**
 - ✧ **S&A**



Application



➤ AC-130 Gunship

- ✧ Air Force Special Operations Command (AFSOC)
- ✧ Modified M137 105mm Cannon





Need for Improved Proximity Fuze



- **High Fragmentation (HF) Version of HE M1 (MOD) Cartridge**
 - ✧ **Maximum effectiveness requires precise HOB regardless of target reflectivity and approach angle**
 - ✧ **Proximity fuzes currently available are not optimized for the HF round**
 - ◆ **Wide HOB variation**
 - ◆ **Average HOB not optimum**
 - ◆ **Insufficient reliability**



Design Goals



- **Tight HOB Control**
 - ✧ **Nominal HOB = 15 ft**
- **Impact Back-up Mode**
- **Highly Reliable**
- **Surface Mount Technology**
- **Maximum Commonality to Existing Designs**
 - ✧ **Proven Reliability**
 - ✧ **Reduced Cost**



Design Approach

- RF Front End
- Signal Processor
- S&A
- Battery



RF Front End



- **Based on Highly Successful M734A1 Multi-Option Fuze for Mortars (MOFM)**
 - ✧ **MMIC Transceiver**
 - ✧ **Circular Patch Antenna**
 - ◆ **Wide Bandwidth**
 - ◆ **Broad Coverage**
 - ✧ **Additional IF Gain Stage**



Signal Processor



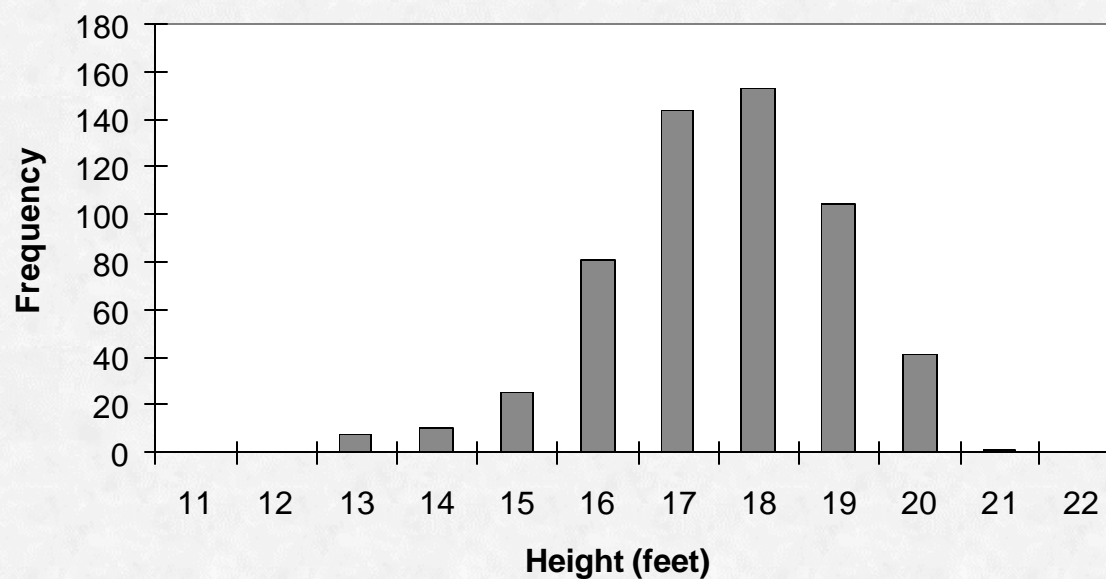
- **Same Signal Processor as the M734A1 MOFM**
- **Utilizes DDR Technology**
 - ✧ **Accurate HOB Control**
 - ✧ **Robust Anti-jamming Performance**
- **Highly Integrated**
 - ✧ **Single Chip Solution**
 - ✧ **High Reliability**
 - ✧ **Low Cost**



TYPICAL PERFORMANCE



**M734A1 - 120mm Prox Mode, Charge 0, -40°F, 1500 QE
HOB Histogram**





S&A



- **MK41 is a Qualified Design**
- **Low Cost**
- **Performance Parameters:**
 - ✧ **Setback g Level:** **26,000 g**
 - ✧ **Spin Rate:** **410 rps**
 - ✧ **Velocity:** **3075 ft/sec**



Battery



- **Manufactured the Netherlands by Thales Munitronics**
 - ✧ **Formerly Signaal USFA**
- **Chemistry: Lithium**
- **Proven Design for Artillery**
- **Performance Parameters:**
 - ✧ **Operational Life: 150 seconds min**
 - ✧ **Current: 150 mA**
 - ✧ **End of Life Voltage: 5.5 Volts min**
 - ✧ **Rise Time: 100 mSec max**
 - ✧ **Required Setback: 2000 g's min**
 - ✧ **Required Spin: 2500 rpm min**
 - ✧ **Operating Temperature: -40F to +145F**



Photo of FMU-160/B

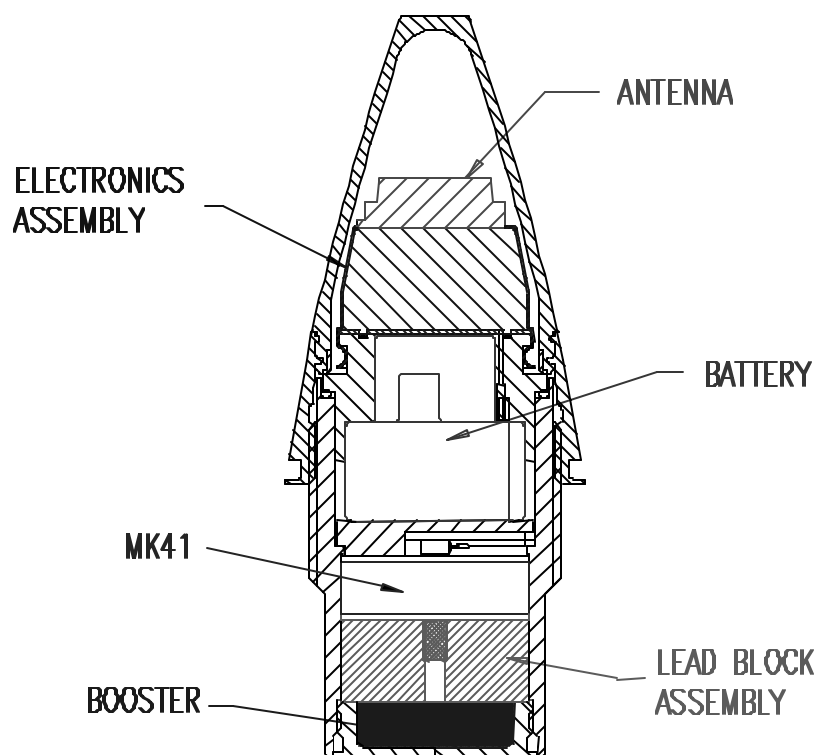
EDC



<http://www.kdi-ppi.com>



Summary



➤ **ACCURATE**

➤ **RELIABLE**

➤ **AFFORDABLE**